



Critical Events and Ministerial Turnover in Latin American Presidential Democracies

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Introduction

Introduction

My research question is: **How do resignation calls affect cabinet reallocations and dismissals of ministers in Latin American presidential democracies?**

I use a combination of a presidential **protection policy** and a **dismissal rule**: The president protects ministers subjected to a first questioning but, because they are then contaminated, the probability of ministerial termination increases as from a second call for their resignation.

- Archival review of press reports in 12 LA countries (mid-1970s-2021), compiling a dataset on ministerial turnover and resignation calls.
- Data mining (OCR) and machine learning and then a semiparametric approach of competing risks and PS matching.

Theory and Empirical Expectations

Protection Policy and Dismissal Rule

To limit agency problems, the president could apply a combination of protection policy and a dismissal rule, borrowed from the rules modelled for parliamentary systems by Dewan and Myatt (2007, 2010; see also Berlinski et al., 2010).

The protection policy considers that ministers can be: (1) **tainted** by having been affected by a scandal or (2) have a record **clean of questioning**.

- If a tainted minister is again affected by a scandal, dismissal should be highly probable (limiting moral hazard).
- A minister with a clean record should be protected by the principal to encourage political activism (limiting agency loss).

Protection Policy Expectation

The first resignation call should serve as a warning for the minister to improve their performance rather than as an immediate threat to their position. This protection policy should have two outcomes: the retention of the questioned ministers or their reallocation to a different portfolio.

Thus, my first hypothesis is:

- **Protection Policy Hypothesis.** The first call for a minister's resignation raises the probability of reallocation, but not of individual terminations.

Dismissal Rule Expectation

If ministers whose resignation has already been called for are involved in a new scandal, the president could activate the dismissal rule.

The dismissal of a tainted minister could operate as a positive signal in the chain of delegation between voters and the president ([Dewan and Dowding, 2005](#)). In addition, dismissing tainted ministers could be a way to limit moral hazard by demonstrating that officeholders' actions are not insulated from negative consequences. Accordingly, the empirical expectation is:

- **Dismissal Rule Hypothesis.** The second and subsequent calls for a minister's resignation raise the probability of individual terminations, but not of reallocations.

Moderation Analysis

I focus on tainted ministers and test the reliability of the dismissal rule under two conditions: **nonpartisanship** and **seniority** of ministers.

First, the appointment of nonpartisan ministers indeed operates as a strategy for dealing with the agency problems, such as agency loss, information asymmetries and moral hazard, that can occur when the agent is a partisan minister (Altman, 2000; González-Bustamante, 2022; Martínez-Gallardo and Schleiter, 2015).

Second, by appointing and protecting more technically skilled cabinet members, presidents should achieve good public policy outcomes and send positive signals to the electorate (electoral accountability literature; see for example Besley and Case, 2003).

Empirical Strategy

Cases and Data Gathering

I combined the Tesseract Optical Character Recognition (**OCR**; see [Ooms, 2021](#)) with different **semi-supervised machine learning models** to distinguish between resignation calls and other mentions of cabinet members in the press. This was applied to **46 years** of **Latin American Weekly Report (LAWR) archives**.



Tesseract Optical Character Recognition



How Domingo Cavallo rose to become Menem's virtual prime minister

Argentina are still hotly debating what lay behind the sudden resignations of President Raúl Alfonsín and his replacement, Domingo Cavallo. And the rapid, uncontrolled uprising of the dollar rate – dismissed as suffi- cient reason, and much has been published about all sorts of politi-

cals. One that seems firmly to have got the upper hand is that Cavallo's resignation at Menem – and, according to sources with access to the man himself, his desire to gain unquestioning support from the Bush administration.

This, at a time when even such highly placed members of his government as Vice-President Eduardo Duhalde and Minister of Finance, Alberto Menem, were prepared to engineer Menem's departure from the Presidency, has been the most talked about of which of the many constitutional succession procedures would find most favour.

Many expect Cavallo to push for an agreement with the main opposition party, Radical Civic Union (UCR), on a new form of coalition that would ensure the continuity of the government, to provide over the period of transition between the two presidents, prominent politicians and businessmen, and even US diplomats, have been exploring since late 1990. ■

INSIDE	
PERU: Weather spread of cholera epidemic, (2)	VENEZUELA: Lower prices force budget review, (2)
EQUADOR: Holiday disease impact on oil, (2)	BOLIVIA: A Soviet partner for Latin America? (2)
COSTA RICA: Preparations for the 1992 elections, (4)	CHILE: Proposal to extend Ayala's mandate, (6)
HAWAII: Aristotle faces first major challenges, (7)	COSTA RICA: Preparing a new batch of cases, (11)
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How Domingo Cavallo rose to become Menem's virtual prime minister

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cient reason, and much has been published about all sorts of political plots.

It was at this point, the scenario goes, that Cavallo bolted from the scene, leaving no evidence. As a result, Cavallo has emerged not only as the new economy minister, but also as a virtual prime minister, able to organise the share-out of key ministerial posts and even to appoint men and women to positions leading towards his decision to pardon the military leaders of the 'dirty war' of 1976-1978. The scenario of his independence from the highest reaches of the government, and the reasons that led him to do so, have replaced even Senator Eduardo Duhalde, the President's brother, as Senator Menem's most trusted adviser.

Or, it may be, that Cavallo had several lines written in his resignation at Menem – and, according to sources with access to the man himself, his desire to gain unquestioning support from the Bush administration.

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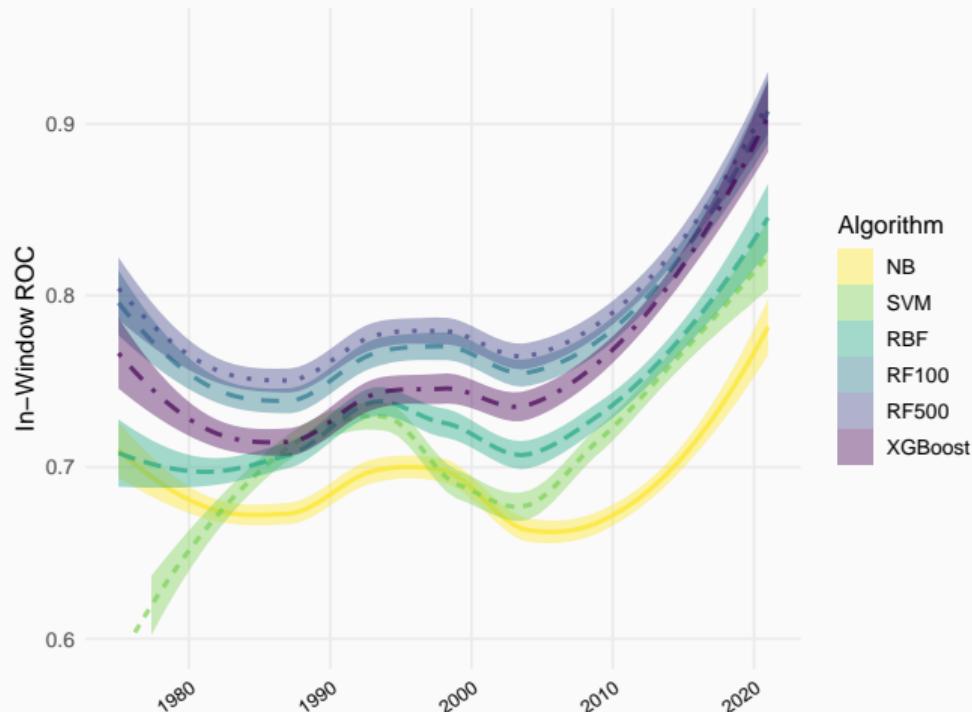
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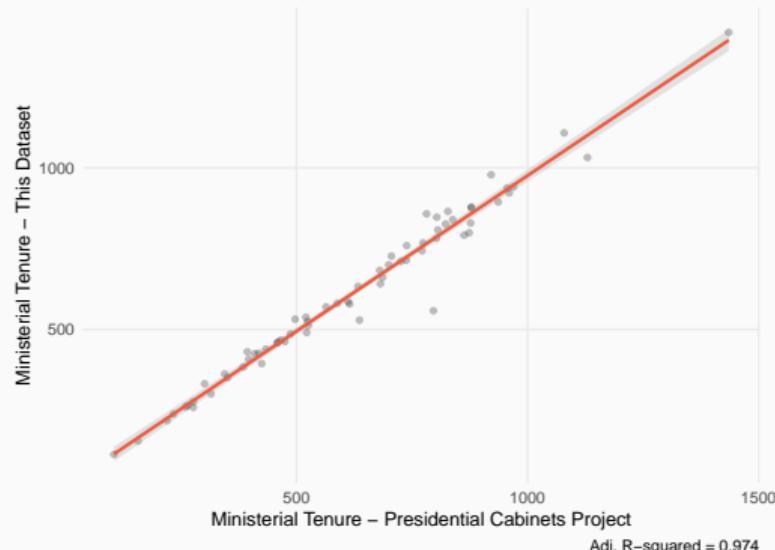
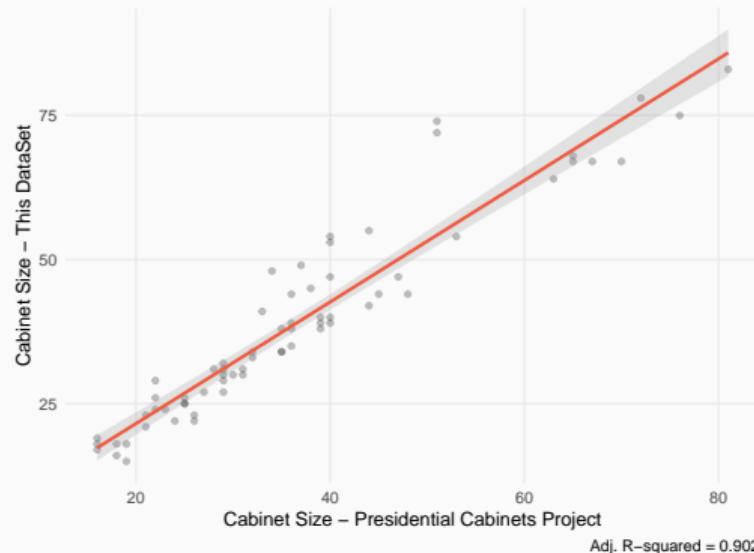
Goodness-of-Prediction of Semisupervised Models (1975-2021)



Following Greene et al. (2019), I trained semisupervised models using a **five-year fixed rolling window** from 1975 to 2021 to train algorithms and predict resignation calls.

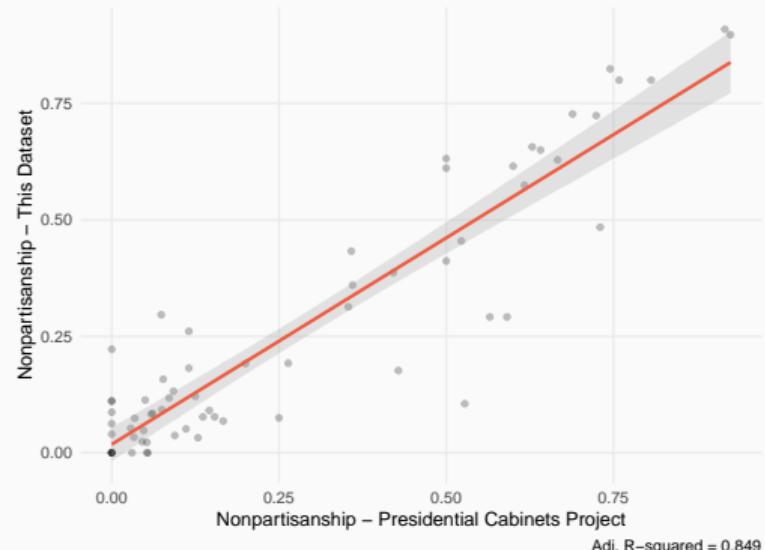
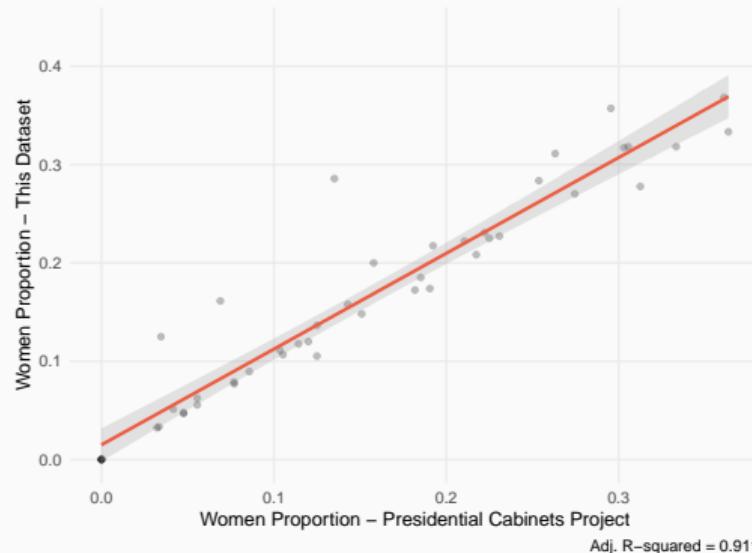
Random Forest classifiers with 500 trees 10-fold cross-validated.

Cross-Validation against Similar Datasets



Note. Concurrent presidential terms were used for comparisons with the Presidential Cabinet Project (see Camerlo and Martínez-Gallardo, 2020).

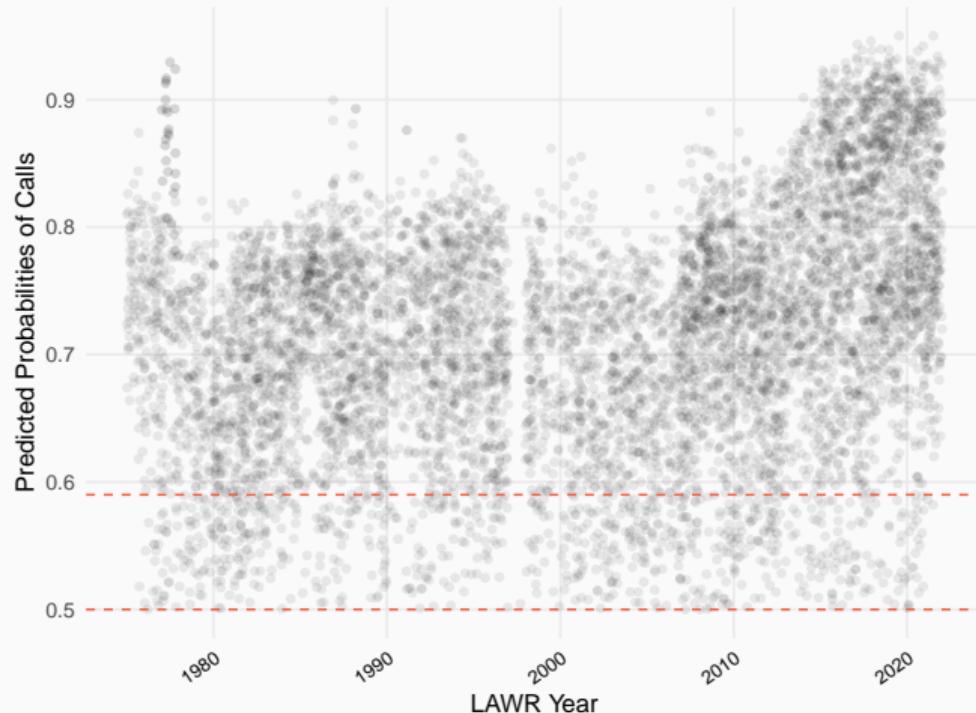
Cross-Validation against Similar Datasets



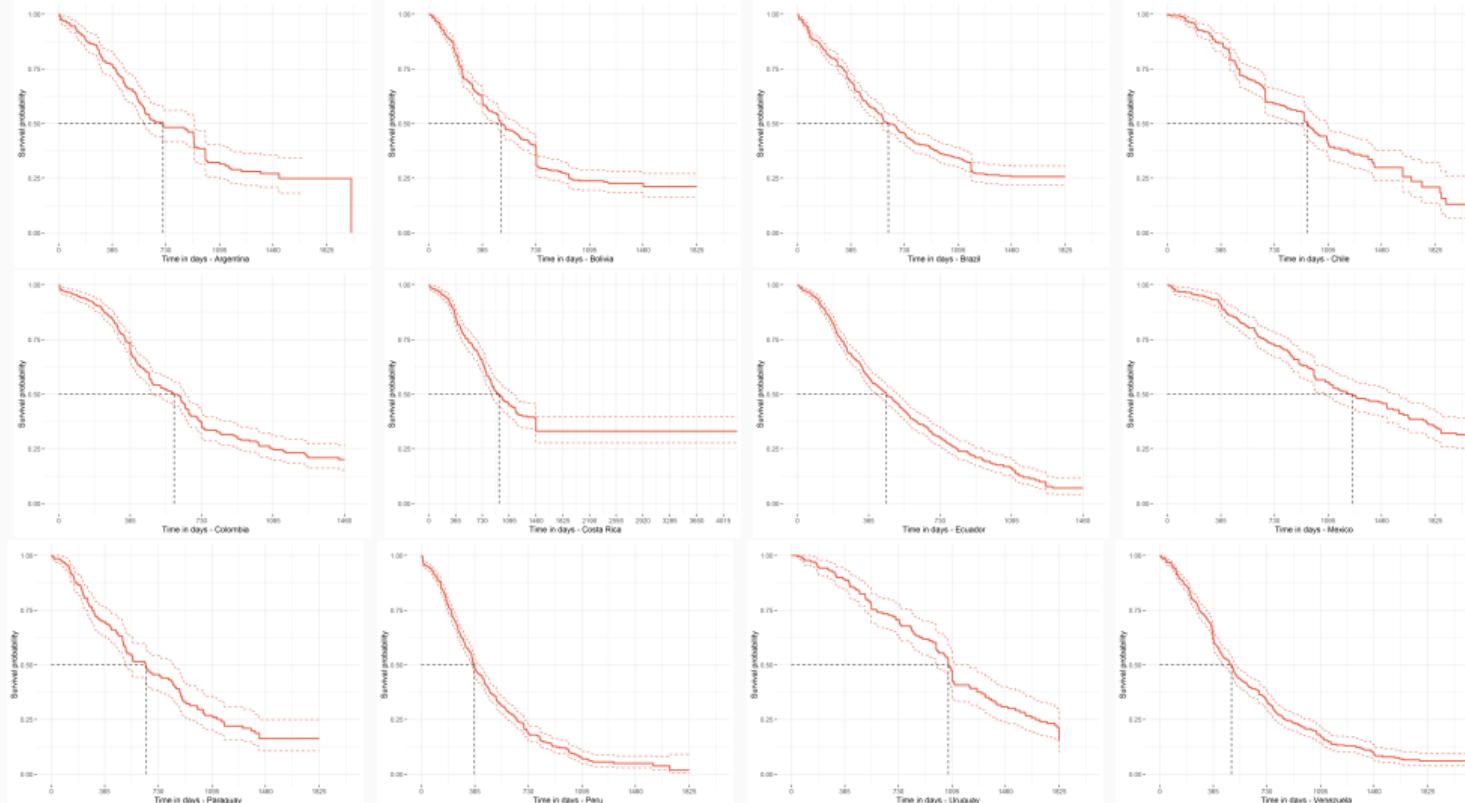
Note. Concurrent presidential terms were used for comparisons with the Presidential Cabinet Project (see [Camerlo and Martínez-Gallardo, 2020](#)).

Augmented Artificial Intelligence (A2I)

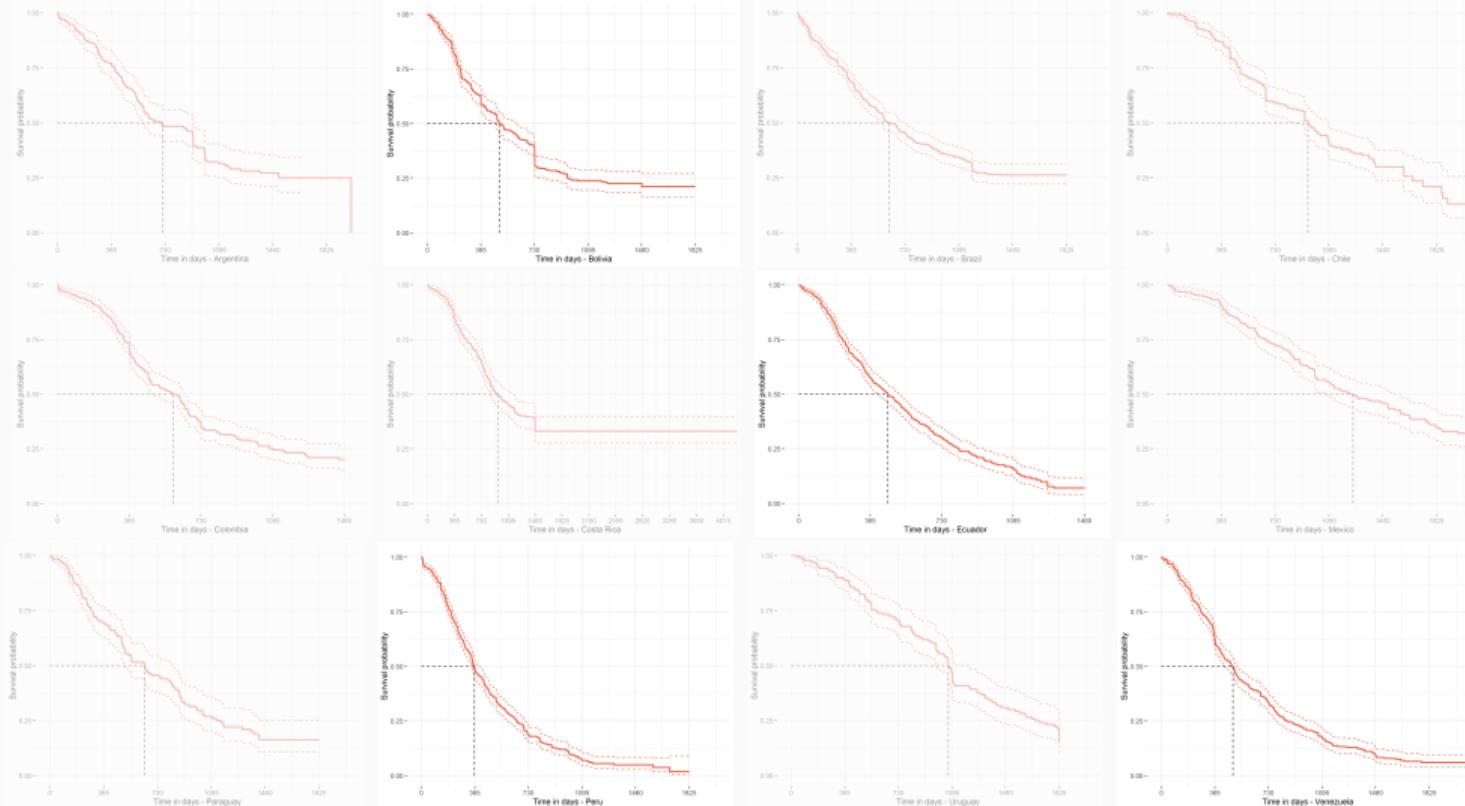
I performed an augmented artificial intelligence process based on a **human review** of the predicted observations with low confidence values to improve the data's quality.



Kaplan-Meier Survival Estimations in 12 Presidential Cabinets



Kaplan-Meier Survival Estimations in 12 Presidential Cabinets



Time-Dependent Data Encoding

The dataset was **time-dependent encoded** using monthly intervals with the (start, stop] model (Therneau et al., 2020). This allowed us to incorporate **time-varying covariates**.

We observe the time events T considering monthly intervals and k -th **competing risks** $Y_{k[i]}$ for **reallocations** ($k = 1$) and **individual ministerial terminations** ($k = 2$) by constructing the monthly intervals $Z(t) = I(t > Y_{k[i]})$.

I then used the closed interval of i -th observations (officeholders) as an endpoint in a function for multi-state survival variables obtaining an outcome dataset to control competing risks with **Fine-Gray weights** (Fine and Gray, 1999; Therneau et al., 2022).

Propensity Score and NNM

I distinguish $D_{j[i]}$ as **1st resignation call** ($j = 1$) and the **2nd or subsequent ones** ($j = 2$). Consequently, I regress $D_{j[i]}$ on a vector of covariates and potential confounders $X_{m[i]}$ that considers quadratic presidential term patterns dummies and type of ministry, using probit models.

I also incorporated country FE and Fine-Gray weights w_1 . This is our **naive propensity score estimation**:

$$D_{j[i]} = \varphi \left[\alpha + \sum_{m=1}^M \gamma_m w_{1[i]} X_{m[i]} + \zeta w_{1[i]} \text{country}_i + \varepsilon_i \right] \quad (1)$$

Propensity Score and NNM

Then, I expanded our PS estimation by incorporating **additional confounders** to $X_{m[i]}$ to **block the backdoor path**. I favour the incorporation of covariates that can affect the presidential decision (protect/dismiss), as well as calls:

- Presidential leverage (control of the relevant Houses)
- Opposition fragmentation*
- Government fragmentation*
- Government type (single-party vs. coalition)
- Presidential re-election
- Cumulative level of resignation calls**

* probability that two randomly selected deputies belong to different parties.

** to improve precision since it could be a competing exposure rather than a confounder.

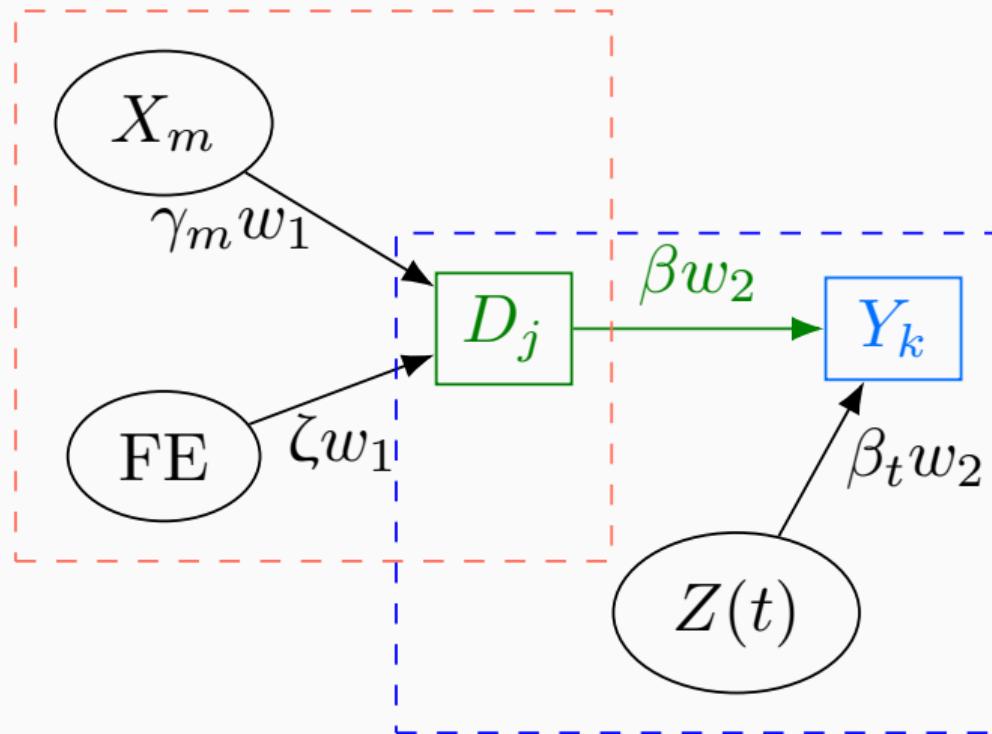
Competing Risks Models

After matching, the outcome analyses were carried out in the different matched samples with Fine-Gray subdistribution hazard models to estimate the **ATT for observational studies**, that is, the effect on ministers who received resignation calls.

The models regressed $Y_{k[i]}$, where $k = 1$ for **reallocations** and $k = 2$ for **dismissals**, on resignation calls indicators $D_{j[i]}$, using PS weights w_2 and $Z(t)$ intervals:

$$\lambda_k(t_i) = \lambda_{0[k]}(t_i) \exp [\beta_t w_{2[i]} Z_i(t) + \beta w_{2[i]} D_{j[i]} + \varepsilon_i] \quad (2)$$

Nonparametric Graphical Representation



Results

Estimating the Protection Policy

	Reallocations		Ind. Terminations	
	Model I	Model II	Model III	Model IV
First resignation call	1.934*	3.304***	1.089***	1.628***
	(1.068)	(1.081)	(0.351)	(0.502)
Matching Estimand	NNM ATT	NNM ATT	NNM ATT	NNM ATT
Competing risk	Ind. Term.	Ind. Term.	Realloc.	Realloc.
PS weights	Fine-Gray	Fine-Gray	Fine-Gray	Fine-Gray
Weights outcome	No	PS	No	PS
Nonpartisanship	No	PS	No	PS
Seniority	No	PS	No	PS
Control of Houses	No	PS	No	PS
Opp. fragmentation	No	PS	No	PS
Gov. fragmentation	No	PS	No	PS
Type of government	No	PS	No	PS
Re-election permitted	No	PS	No	PS
Cumulative gov. calls	No	PS	No	PS
Quadratic term patterns	PS	PS	PS	PS
Type of ministry	PS	PS	PS	PS
Country FE	PS	PS	PS	PS
Obs. clustering	PS/Yes	PS/Yes	PS/Yes	PS/Yes
Log-Rank	4.430**	4.069**	10.785***	12.213***
AIC	123.542	106.566	690.058	475.164
C-Index	0.676	0.690	0.614	0.653
N	10,143	9,900	8,884	6,580
Log Likelihood	-60.771	-52.283	-344.029	-236.582

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

I reject the **Protection Policy Hypothesis** as there is no evidence to suggest that the first call alone increases the probability of a minister being repositioned.

Although we reject this hypothesis, we found (novel empirical) evidence that reallocations and individual terminations are competing risks at the early stage of public questioning.

Estimating the Dismissal Rule

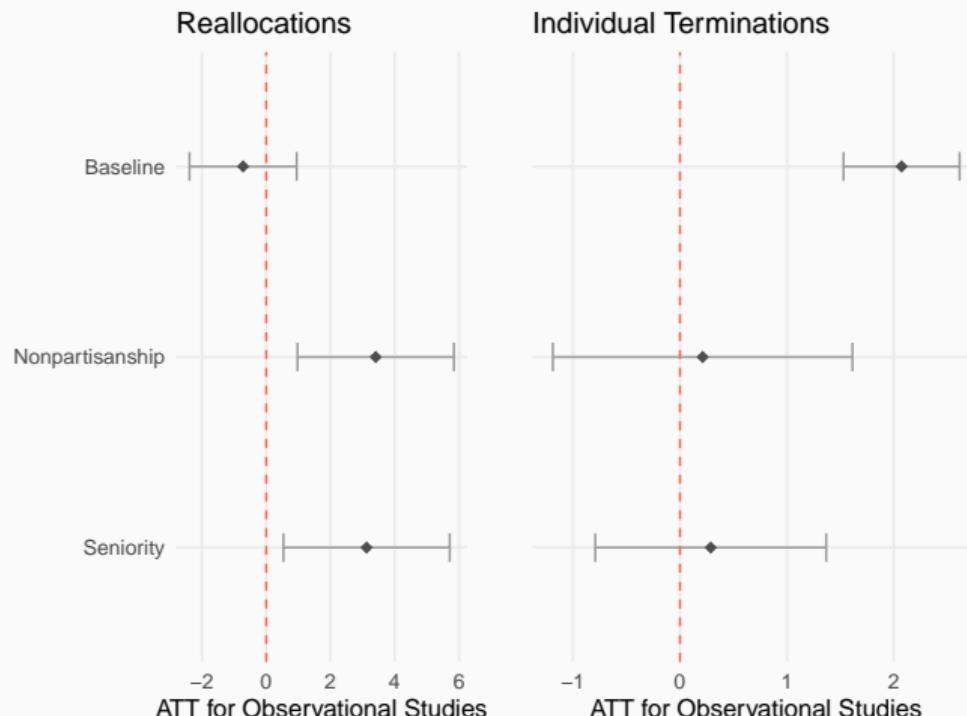
Model IV with the block of confounders has an estimated ATT of 2.073. This implies the risk of a minister's removal increases eightfold.

These results confirm the **Dismissal Rule Hypothesis**.

	Reallocations		Ind. Terminations	
	Model I	Model II	Model III	Model IV
Second or subsequent resignation calls	1.099 (0.744)	-0.729 (0.851)	1.329*** (0.283)	2.073*** (0.277)
Matching	NNM	NNM	NNM	NNM
Estimand	ATT	ATT	ATT	ATT
Competing risk	Ind. Term.	Ind. Term.	Realloc.	Realloc.
PS weights	Fine-Gray	Fine-Gray	Fine-Gray	Fine-Gray
Weights outcome	No	PS	No	PS
Nonpartisanship	No	PS	No	PS
Seniority	No	PS	No	PS
Control of Houses	No	PS	No	PS
Opp. fragmentation	No	PS	No	PS
Gov. fragmentation	No	PS	No	PS
Type of government	No	PS	No	PS
Re-election permitted	No	PS	No	PS
Cumulative gov. calls	No	PS	No	PS
Quadratic term patterns	PS	PS	PS	PS
Type of ministry	PS	PS	PS	PS
Country FE	PS	PS	PS	PS
Obs. clustering	PS/Yes	PS/Yes	PS/Yes	PS/Yes
Log-Rank	2.444*	4.386**	24.698***	35.444***
AIC	422.574	622.115	3,292.559	3,149.094
C-Index	0.566	0.595	0.573	0.595
N	30,422	31,250	21,511	21,905
Log Likelihood	-210.287	-310.058	-1,645.279	-1,573.547

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Moderation Analysis



The effect of resignation calls on the probability of reallocation is more substantial.

The estimated effects are not significant for individual termination in the case of non-partisanship ($p = 0.766$) or seniority ($p = 0.602$), confirming a protection strategy.

Placebo Models

I repeated the primary models with resignation calls altered $\tilde{D}_{j[i]}$ with the aim of applying a placebo test.

The **absence of a significant ATT** in most models tends to confirm the main results.

	Reallocations		Ind. Terminations	
	Model I	Model II	Model III	Model IV
Placebo (press mentions)	-0.129 (0.766)		0.678 (0.480)	
Placebo (unrelated press mentions)		-0.543 (0.523)		-0.627 (0.385)
Matching	NNM	NNM	NNM	NNM
Estimand	ATT	ATT	ATT	ATT
Competing risk	Ind. Term.	Ind. Term.	Realloc.	Realloc.
PS weights	Fine-Gray	Fine-Gray	Fine-Gray	Fine-Gray
Weights outcome	PS	PS	PS	PS
Nonpartisanship	PS	PS	PS	PS
Seniority	PS	PS	PS	PS
Control of Houses	PS	PS	PS	PS
Opp. fragmentation	PS	PS	PS	PS
Gov. fragmentation	PS	PS	PS	PS
Type of government	PS	PS	PS	PS
Re-election permitted	PS	PS	PS	PS
Cumulative gov. calls	PS	PS	PS	PS
Quadratic term patterns	PS	PS	PS	PS
Type of ministry	PS	PS	PS	PS
Country FE	PS	PS	PS	PS
Obs. clustering	PS/Yes	PS/Yes	PS/Yes	PS/Yes
Log-Rank	0.271	7.501***	28.984***	78.112***
AIC	2,057.048	3,668.754	13,331.973	26,931.196
C-Index	0.523	0.530	0.534	0.553
N	108,493	180,699	81,736	134,976
Log Likelihood	-1,027.524	-1,833.377	-6,664.987	-13,464.600

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Robustness Checks

The robustness checks using **additional confounders**, an **alternative matching algorithm** (caliper) and a **special standard error estimator** (Austin and Fine, 2019) show the same patterns as the main analyses.

When incorporating macroeconomic indicators, presidential approval and controlling for low levels of freedom of speech as potential confounders, the results were not altered (**low residual confounding**).

The exclusion of these **stochastic events** was made because I gave priority to the use of **resignation calls** as a noisy but empirically efficient indicator.

Takeaways

Takeaways

- ☑ I offer novel indicators such as **reallocations** and **resignation calls**. In addition, the use of semi-supervised ML models is also an innovation.
- ☑ The theoretical argument is simple: The president protects her ministers in the face of an initial questioning by reallocating them to a new ministry but removes them from the cabinet in the face of further resignation calls. **In a nutshell, it is like in the football.**
- ☑ Combining semiparametric competing risks models and propensity score contributes to tackling the **non-random selection problem** in observational data.
- ☑ The risk of ministerial terminations increases **eightfold** from the second call, but it is **moderated** in the case of nonpartisan and senior ministers.

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Do you have any questions?

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